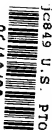


06/13/00



jc849 U.S. PTO

PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

UTILITY PATENT APPLICATION TRANSMITTAL LETTER

jc714 U.S. PTO
09/592758
06/13/00Atty./Agent Docket No.: CE03958RMailing Date: June 13, 2000Express Mail Label No.: EK647971835US

Assistant Commissioner for Patents
Box Patent Application
Washington, D.C. 20231

Dear Sir:

Transmitted herewith for filing under 37 CFR 1.53 (b) is a Nonprovisional Utility Patent Application:

☒ X New Application; or

☐ Continuation; or ☐ Divisional; or ☐ Continuation-in-Part (CIP) Application of prior US application No. _____, filed on _____, having US Examiner _____, in Group Art Unit _____ : of

Inventor(s): Powers et al.For (Title): Manager-Directed Method for Event Pressure ReductionThis transmittal letter has 2 total pages.

Enclosed are:

☒ X 4 sheets of drawings, along with 20 pages of specification, claims, and abstract.☒ X Oath or Declaration Combined with Power of Attorney (3 pages 2 executed original documents)☒ X Newly Executed (original or copy)☐ Copy from a prior application (if this is a Continuation/Division with no new matter)

☐ Statement deleting named inventor(s) in prior application if this is a Continuation/Division (See 37 CFR 1.63(d)(2) and 1.33(b).)

☐ Consider as the above Statement, Please delete as inventors for this application the following inventors named in the prior application: _____

☐ Foreign priority to _____ Patent application having serial number _____, and a filing date of _____ is hereby claimed under 35 USC 119.

☐ A copy of the priority document is included herewith.

☒ X An Assignment Transmittal Letter and Assignment of the invention to MOTOROLA, INC.☒ X An Information Disclosure Statement (IDS), with ☒ X PTO-1449, and 8 citation copies.

☐ Petition For Extension of Time for parent application of the present Continuation/Division/CIP application

☒ X Print EFS Inventor Information Sheet(s).

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☒ Return Receipt Postcard

☐ Preliminary Amendment

☐ Please cancel filed claims _____.

☐ Incorporation by Reference (for Continuation/Division application) The entire disclosure of the prior application, from which a copy of the oath or declaration is supplied, is considered as being part of the disclosure of the accompanying application and is hereby incorporated by reference therein.

☐ Since the present application is based on a prior US application, please amend the specification by adding the following sentence before the first sentence of the specification: "The present application is based on prior US application No. _____, filed on _____, which is hereby incorporated by reference, and priority thereto for common subject matter is hereby claimed."

☒ The filing fee is calculated as follows:

CLAIMS AS FILED, LESS ANY CANCELED BY AMENDMENT

	NUMBER OF CLAIMS	NUMBER EXTRA	RATE	FEE
TOTAL CLAIMS	20 - 20 =	0	X \$18	= \$.00
INDEPENDENT CLAIMS	3 - 3 =	0	X \$78	= \$.00
MULTIPLE DEPENDENT CLAIMS			\$260	= \$ 0.00
			BASIC FEE	= \$ 690.00
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☒ Please charge Deposit Account No. 13-4772 in the amount of \$ 690.00 for the Total Filing Fee.

☒ The Commissioner is hereby authorized to charge any additional fees which may be required now or in the future under 37 CFR 1.16 or 37 CFR 1.17, including any present or future time extension fees which may be required, or credit any overpayment to Deposit Account No. 13-4772

☒ One additional copy of this sheet is enclosed

Please forward all correspondence to:

Customer Number **22917**

By: _____


Kenneth A. Haas
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Phone: (847) 576-0379
Fax: (847) 576-3750

[illegible]

CORRESPONDENCE INFORMATION

APPLICATION INFORMATION

REPRESENTATIVE INFORMATION

Representative Customer Number:: 22917

Source:: PrintEFS Version 1.0.1

Within each of these elements are numerous subsystems and components. For example, a base station will at least include radio frequency power amplifiers, frequency synthesizers, signal converters, modems, power supplies, fans, etc. A CBSC, for example, may include a mobility manager, voice coders, transcoders, echo cancellers, and may further provide a link to an operations and maintenance center (OMC). The MSC includes systems for switching calls and for providing call related services such as call waiting, call forwarding, voice mail, and the like. Needless to say there are many systems, subsystems, system elements and

components that have to function and interact properly for the cellular communication system to work. Furthermore, the many systems, subsystems, system elements and components of a cellular network are arranged hierarchically, wherein the operation of a few or many components may be controlled and managed by one or several elements at a higher hierarchical position within the network. As a result, certain system elements and components of a cellular network are considered managers, which manage the operations of certain other network elements by communicating with agents residing on the network elements.

When things go wrong in a cellular communication system, there are a number of indications. For example, audible and visual indicators (alarms and flashing lights) may activate indicating one or more elements are not functioning properly. Network performance statistics, observed by the cell network operator, may move outside a normal operating range thus indicating that performance of the network is less than optimal and hence suggesting a problem with the system. A general indication telling the operator something has happened at a network element is known as an event or event notification. While most events are informative in nature, some events notify an operator that something is wrong in the network. This is a special form of an event called an alarm. The large volume of data generated within the communication system and the complexity of the data often exceeds the ability of the operators to comprehend or take action on a particular problem, especially if confronted with thousands of events during a short period of time. This leaves the system operators unable to effectively manage the system.

The typical response to a problem is to observe the alarm or alarms, and to react to whatever it is generating the alarm condition. This is known as fault based reaction. Several specialized schemes such as alarm correlation, the use of filters, or the use of simple event counters in the managers have been established in an attempt to reduce the number of events and alarms that must be reviewed or investigated by system operators. One of the problems with such schemes is that the transmission of too many events and alarms from agents to managers within a

cellular network can clog the communication link between manager and agent. Additionally, a large number of events may cause the operator to miss a critical alarm. Furthermore, the processing resources of a manager may be severely curtailed as a result of reviewing and investigating the large number of event notifications and alarms that it receives from one or many agents. To reduce the large stream of event notifications and alarms that are transmitted from an agent to a manager, specialized event counters have been utilized which operate within each agent to reduce the event notification stream prior to its transmission to the manager. These methods, however, tend to require highly specific software developed especially for reducing event notifications, wherein the event reduction method is put directly into the software. As a result, implementation of the software requires a large amount of special configuration set-up on the part of the operator. Furthermore, with these methods, duplication of functionality within management areas is unavoidable. Such duplication results in large agent code images, which can be especially troublesome when dealing with embedded systems wherein memory size is highly constrained.

Current systems typically utilize filters at the agent level to reduce the flow of event notifications to the manager. However, the current systems use event counting and event performance thresholding schemes at the manager level to discriminate between alarming and non-alarming events. Because of the hierarchical nature of cellular networks, expansion of the network results in maintenance and operation of a higher number of agents by each of the managers. Therefore, with the current event notification reduction schemes being performed in the managers, expansion of the network can severely hinder the capabilities of the managers. Thus, there is a need for a more intelligent system and efficient system for managing events at the network element (agent), and reducing events pressure using existing systems and components.

Brief Description of the Drawings

FIG. 1 is a block diagram representation of a wireless communication system.

FIG. 2 is a block diagram showing a manager creating a filter on an agent in accordance with the present invention.

FIG. 3 is a block diagram showing a manager creating an event counter object on an agent in accordance with the present invention.

5 FIG. 4 is a block diagram showing a manager creating an event counter and performance measurement criteria on an agent in accordance with the present invention.

FIG. 5 is a block diagram showing the operation of the present invention in detail.

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Detailed Description of the Preferred Embodiments

The present invention provides a method and apparatus for reducing event pressure on managers in a cellular network. In accordance with the preferred embodiments of the invention, event pressure reduction is performed in the agent, and the agent emits only an alarm to the manager if necessary. The present invention comprises three coupled components residing on the agent: a filter, an event counter module, and a performance measurement module. The filter receives event notifications from the agent and provides filtered events to the event counter module. The event counter module creates event count information for each filtered event and provides the event count information to a performance measurement module. The event count information includes event specific threshold criteria. Based on the event count information and the threshold criteria, the performance measurement module determines whether the filtered event exceeds the established threshold for that event. If the event threshold is exceeded, the performance measurement module alarms the manager so that a system operator can alleviate the problem which triggered the alarming event.

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The present invention will be described in terms of a wireless communication system operating in accordance with one of several communication standards. These standards include analog, digital or dual-mode communication system protocols such as, but not limited to, the Advanced Mobile Phone System (AMPS), the Narrowband Advanced Mobile Phone System

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(NAMPS), the Global System for Mobile Communications (GSM), the Personal Digital Communications/Personal Communication Systems (PDC/PCS), the IS-55 Time Division Multiple Access digital cellular, the IS-95 Code Division Multiple Access digital cellular and variations and evolutions of these protocols. As shown in FIG.1, a wireless communication system 10 includes a mobile switching center (MSC) 12, a first base station controller (BSC) 14 and a second BSC 16 servicing a total service area 22. As is known for such systems, each BSC 14 and 16 has associated therewith a plurality of base transceiver stations (BTSs), 24 and 26, respectively servicing communication cells, microcells, picocells and the like, generally shown as cells 18 and cells 20, respectively. It will be appreciated that additional or fewer cells may be implemented as required and without departing from the fair scope of the present invention. MSC 12, BSCs 14 and 16, and BTSs 24 and 26, are specified and operate in accordance with the applicable standard or standards for providing wireless communication services to mobile stations (generally shown as 28) operating in cells 18 and 20. Also shown in FIG. 1 and coupled respectively to BSC 14 and BSC 16 are an Operations and Maintenance Center-Radio (OMC-R) 30 and an OMC-R 32. A single OMC-R 30 may service multiple BSCs, and the actual number of OMC-Rs 30, 32 in system 10 will depend on its size. For example, a small system may require only a single OMC-R 30 to which all of the BSCs are coupled, while a large system may include several OMC-Rs 30, 32. As shown in FIG. 1, the operations of each MSC is managed by an Operations and Maintenance Center-Switch (OMC-S) 34.

A set of network elements will typically have an Operations and Maintenance Center (OMC). All network elements related to the air interface will have an OMC-R 30, while all network elements related to the switching environment will have an OMC-S 34. To consolidate the management of a large system, the OMC-R 30 and OMC-S 34 will report to a higher level manager, the Network Maintenance Center (NMC) (not shown in FIG. 1). The relationship of OMC-R 30 and OMC-S 34 to NMC is that of agents to manager. The OMC-R 30, OMC-S 34, and NMC are generally recognized as managers, while the BSC 14, MSC 12, and BTS 24 are recognized as network elements. Within a network

element there is an agent, which is in communication interface with the manager. Generally, a network element will emit an event notification in a proprietary format. The agent in the network element will take the notification and put it into a standard format for communication with the manager.

5 As will be appreciated, the present invention utilizes existing systems and components for managing network functionality to reduce event pressure between managers and agents. Specifically, the present invention uses a filter, an event counter module, and a performance measurement module to reduce event pressure on the manager. As shown in FIG. 2, the manager 42 initially establishes a filter on the agent 44. The manager 42 establishes the filter with a name that identifies the event for which the filter is being established. Further, the manager directs the
10 the filter name to be sent to an event counter module. The agent 44 responds to the manager 42 with a confirmation that the filter was created.

The manager 42 then requests the creation of an event counter object on
15 the agent 44. Each event counter object defines thresholding criteria, event count information, and information on when to send an alarm to the manager if a threshold is exceeded. The agent 44 responds with a confirmation that the event counter was created. Each event counter object is filter specific. The event counters that are defined by the event counter objects are processed by an event
20 counter module that resides on the agent. Finally, the manager sends the appropriate performance measurement information to the agent, and the agent sets up the performance measurement criteria in the performance measurement module. The performance measurement module evaluates the event count information for each filtered event and emits an alarm to the manager if the
25 threshold for the filtered event is exceeded.

The processes by which the manager requests the creation of event counters and threshold criteria for event notifications is shown in more detail in FIG. 4. The manager 42 requests the creation of an event object 52 on the agent 44. The agent 44 confirms with the manager 42 the creation of the event counter
30 object 52. The event counter object 52 contains the filter name, directions on creating an event counter, performance measurement definitions, and thresholding

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criteria for each filtered event. The event counter object 52 creates an event counter for each event in the event counter module 54 by establishing a memory location for the event counter, specifying target events for the filter along with the filter name for the event, and initializing the event counter to zero. The event counter module 54 sends a confirmation to the manager 42 that an event counter for the filtered event was created. The event counter module 54 then establishes performance measurement criteria on the performance measurement module 56 for each filter name. The event counter module 54 further establishes threshold and alarm criteria on the performance measurement module 56 for each filter name. The performance measurement module 56 confirms with the event counter module 54 the creation of an object containing the filter name, new performance measurement criteria, thresholding criteria, and alarm criteria.

FIG. 5 shows the operation of the present invention in detail. An event notification 62 is created in the network element and sent to the agent 44. The event is matched against the filter 64, and if there is a match, the filter name and the event are sent to the event counter module 54. The event counter module 54 increments the counter for the filtered event. Based on the performance measurement definitions (e.g. time limits) established by the event counter object 52, the event counter module 54 determines whether to send the event count measurement to the performance measurement module 56. If the event count measurement matches those of the performance measurement definitions, the filter name and event count measurement for the filtered event are then transmitted to the performance measurement module 56. The performance measurement module 56 compares event count measurement for the filtered event with the threshold criteria established by the event counter module 54 to determine whether the filtered event exceeds the threshold. If the event count exceeds the threshold, an alarm is emitted to the manager 42. Further, as shown by arrow 66 in FIG. 5, the event counter module 54 receives a notification from the performance measurement module 56 to reset the counter for the filtered event to zero. If the threshold is not exceeded, nothing is transmitted to the manager 42 and the event count for the filtered event retains its value until the next occurrence

of the same filtered event.

Consider the following example that illustrates the operation of the present invention in a cellular network. Referring to FIGs. 1-4, it may be desirable to report dropped calls in cell 18 to BSC 14 (i.e. the agent) if the rate of dropped calls exceeds 5 per hour. In current cellular networks (without the present invention), the BSC 14 reports dropped calls to the OMC-R 30 (i.e. the manager). Counting and thresholding of dropped call events is performed in the OMC-R 30. If the OMC-R 30 receives 5 dropped call notifications within an hour from the BSC 14, it will alarm the operator to take corrective action. As the number of BSCs in a cellular network increase, the OMC-Rs will receive more dropped call event notifications and must process the counting and thresholding of the dropped called events. As a result, not only the communication link between each of the OMC-Rs and the BSCs will be clogged, but also, processing capabilities of the OMC-Rs will be severely limited.

As will be appreciated, in a cellular network that uses the method of the present invention, all filtering, counting, and thresholding of dropped call events is performed in the BSC 14, and only an alarm is emitted to the OMC-R 30 if the threshold for dropped call events is exceeded. Initially, the operator provides input to the OMC-R 30 such that the OMC-R 30 sets up a filter for dropped call events in the BSC 14 with directions to send the filter name to the event counter module 54. The OMC-R 30 requests an event counter object 52 creation in the BSC 14 for dropped call events with the counter initially set to zero. The event counter object 52 contains information on counting and thresholding of dropped call events. The event counter module 54 establishes new performance measurement definitions for dropped call events. The threshold criteria for the present example is that the number of dropped calls in one hour may not equal or exceed five. The event counter module 54 not only counts the number of dropped calls with the event counter, but also contains performance measurement definitions, such as the criterion that the time span between the first dropped call and the fifth dropped call cannot be more than one hour. Therefore, the event counter module will use the time limit to see whether the number of events

counted fall within the one hour limit.

Referring to FIGs. 1 and 5, a dropped call in cell 18 creates a notification of a dropped call event in the BSC 14. The dropped call event is filtered and the filter name for the dropped call event is sent to the event counter module 54. The event counter for dropped calls is incremented and the event count for the dropped call is sent to the performance measurement module 56. Along with the event count, the time when the call was dropped is also sent to the performance measurement module 56. If the event count for the dropped call is 5 and if the first and the last of the five dropped call events occurred within a one hour time span, the performance measurement module 56 transmits an alarm to the OMC-R 30. At the OMC-R 30, an operator or end user receives the information and takes corrective measures to alleviate the dropped call problem. The performance measurement module 56 also transmits information to the event counter module 54 to reset the event counter for dropped calls back to zero. In contrast, if the dropped calls number less than 5, or if the event count for the dropped calls is equal to or exceeds 5, with the time between the last and the first dropped call exceeding one hour, then an alarm is not emitted to the OMC-R 30. Furthermore, the event count information will remain unchanged.

The table below consists of other events in a cellular network that generate notifications when the thresholds specific to those events are exceeded. The events and their corresponding notifications, as shown in the table, are only a list of possible events in a cellular network and do not preclude the application of the present invention to other possible events not listed. One skilled in the art can apply the present invention to any event arising from various processes within a cellular network that require an agent to notify a manager about the event.

EVENT	NOTIFICATION
Network initialization timeout - in minutes.	An event notification is generated whenever the threshold is exceeded.
Total BTS power capacity threshold - Watts.	A notification is generated whenever the threshold is exceeded
BTS Wattage lost threshold.	An event notification is generated whenever the threshold is exceeded.
BTS Wattage gained threshold.	A notification is generated whenever the threshold is exceeded
Percentage (%) of network load decrease.	An event notification is generated whenever the threshold is exceeded
Percentage (%) of network load increase.	A notification is generated whenever the threshold is exceeded
CDMA maximum number of channels supported by the carrier function - including the pilot, sync, paging and traffic channels.	A notification is generated whenever the threshold is exceeded
Inter-BSC Hard Handoff Failures: The number of times hard handoff failures occurred. This measurement is done in the target BSC.	A threshold value can be provided for this measurement so a notification is generated whenever the threshold is exceeded.
Inter-BSC Hard Handoff Failures: The number of times hard handoff failures occurred. This measurement is done in the target BSC.	A threshold value can also be provided for this measurement, so a notification is generated whenever the threshold is exceeded.
Inter-BSC Soft Hand off Failures: The number of times soft handoff failures occurred. This measurement is done in the target BSC.	A threshold value can also be provided for this measurement, so a notification is generated whenever the threshold is exceeded.
Excessive BTS Originating Call failures: The number of call originations that resulted in failures. This includes any abnormal failures.	A threshold value can also be provided for this measurement, so a notification is generated whenever the threshold is exceeded.
Excessive BTS Terminating Call Failures: The number of call terminations that resulted in failures. This includes any abnormal failures.	A threshold value can also be provided for this measurement, so a notification is generated whenever the threshold is exceeded.
Number of Call failures in a BTS: This measurement provides the number of call failures within one BTS. This includes all failures and abnormal terminations after the Channel assignment is done by the BTS. This is the summation of origination call failures and termination call failures.	A threshold value can also be provided for this measurement, so a notification is generated whenever the threshold is exceeded.

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Softer Handoff Failures: The number of times softer handoff failures occurred. This measurement is done in the target BSC.	A threshold value can also be provided for this measurement, so a notification is generated whenever the threshold is exceeded.
Mean Traffic Channel (TCH) Busy Time Threshold: The mean number of Traffic Channels allocated and in use per sector expressed as a percentage of time in one hour measurement periods. This is computed by the summation of all the average channel usage measurements in a single carrier in one-hour periods divided by the number of carriers.	A notification is generated whenever the threshold is exceeded.
Paging Message Transmission Failures: The number of pages that could not be completed by the BTS on the Access channel.	A threshold value can also be provided for this measurement, so a notification is generated whenever the threshold is exceeded.
TCH Seizure Failures: The number of times Traffic channels were not successfully seized by Mobile stations. This is measured by timeouts, when the Base Station Acknowledgment Order.	A threshold value can also be provided for this measurement, so a notification is generated whenever the threshold is exceeded.
Maximum Number of Subscribers in HLR: This will be the maximum number of subscribers supported by the HLR.	A notification will be generated whenever the threshold is exceeded.
BHCA capability: The maximum BHCA (Busy Hour Call Attempts), the MSC is capable of achieving.	A notification will be generated whenever the threshold is exceeded.
Maximum Number of Subscribers in VLR: This will be the maximum number of subscribers supported by the VLR.	A notification will be generated whenever the threshold is exceeded.
Maximum Number of Messages: This will be the maximum number of messages that can be stored by the MC.	A notification will be generated whenever the threshold is exceeded.
Number of Failed Authentication's: This will be the number of authentications that were not authenticated by the AC resulting in a failure.	A threshold value can also be provided for this measurement, so a notification is generated whenever the threshold is exceeded.
Number of Unique Subscribers in Failed Authentications: This will be the number of unique subscriber related authentication failures.	A threshold value can be provided. Note that both the number of subscribers and the number of subscriber related authentication failures must be reported using the same time period.
SS (Supplemental Service) Related Operations Failures: The measurement	The measurement generates a notification whenever the threshold is

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Unsuccessful (failed) Outgoing International Calls: This measurement gives the number of failed outgoing international calls.	A threshold value can also be provided for this measurement, so a notification is generated whenever the threshold is exceeded.
Unsuccessful Incoming International Calls: This measurement gives the number of incoming international calls that failed on a particular MSC.	A threshold value can also be provided for this measurement, so a notification is generated whenever the threshold is exceeded.
Registration Failures: This measurement provides the number of unsuccessful registrations. This is measured by the regnot message success indicator received by the VLR MSC.	A threshold value can be provided for this measurement, so a notification is generated whenever the threshold is exceeded.
Shared Authentication Procedures Failures: This measurement provides the number of authentication procedures that resulted in failures in the VLR, when the SSD (Shared Secret Data) is shared.	A threshold value can also be provided for this measurement, so a notification is generated whenever the threshold is exceeded.
Excessive Number of Foreign Roamers: This measurement provides the current number of roaming subscribers by measuring the number of registrations from mobile stations outside the home system.	A threshold value can also be provided for this measurement, so a notification is generated whenever the threshold is exceeded.

Many changes and modifications could be made to the invention without departing from the fair scope and spirit thereof. The scope of some changes is discussed above. The scope of others will become apparent from the appended claims.

Claims

We claim:

1. A system for reducing event notifications emitted to a manager comprising an agent, the agent including:

- 5 a filter receiving event notifications from processes within the agent and providing filtered event notifications;
 an event counter module coupled to the filter for receiving the filtered event notifications from the filter; and
 a performance measurement module coupled to the event counter
10 module for receiving event counter information from the event counter module and sending alarms to the manager.

2. The system of claim 1, wherein the filter is operable to select the filtered event notifications to be sent to the event counter module.

3. The system of claim 2, wherein the manager establishes selection criteria upon which the filter selects the filtered event notifications.

4. The system of claim 1, wherein the manager requests creation of event
20 count objects upon which the event counter module creates event count information from the filtered event notifications.

5. The system of claim 1, wherein the event counter module establishes threshold crossing criteria and alarm emission criteria for the performance
25 measurement module.

6. The system of claim 1, wherein the performance measurement module emits an alarm to the manager if the event counter information exceeds a threshold.

7. A method for reducing the number of event notifications sent to a manager comprising the steps of:

- a) filtering event notifications to provide filtered event notifications;
 - b) counting the filtered event notifications to generate event count
- 5 information from the filtered event notifications;
- c) emitting an alarm if the event count information exceeds a threshold.

8. The method of claim 7, wherein filtering event notifications comprises the steps of :

- a) receiving the event notifications from an agent; and
 - b) selecting the event notifications based on selection criteria to provide
- 10 filtered event notifications.

9. The method of claim 7, wherein counting the event notifications

15 comprises the steps of:

- a) receiving filtered event notifications;
 - b) incrementing an event count based on performance measurement
- definitions for each of the filtered event notifications; and
- c) establishing event count information specific to each of the filtered
- 20 event notifications based on event count criteria.

10. The method of claim 7, wherein emitting an alarm when the event count exceeds a threshold comprises the steps of:

- a) comparing the event count information against a threshold;
 - b) emitting an alarm to the manager if the event count information exceeds
- 25 the threshold; and
- c) resetting the event count information if an alarm is emitted to the manager.

30 11. The method of claim 7, wherein the manager establishes criteria for selection of event notifications.

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19. The apparatus of claim 14, wherein the manager requests creation of event count criteria for the counting means.

20. The apparatus of claim 14, wherein a group of event notifications may
5 be selected by the filtering means and considered as one event by the counting means.

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**MANAGER-DIRECTED METHOD
FOR EVENT PRESSURE REDUCTION**

Abstract of the Disclosure

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The present invention provides a method and apparatus for utilizing existing systems and components in a cellular network for managing network functionality to reduce event pressure between managers and agents. In accordance with the preferred embodiments of the invention, a filter, an event counter module, and a performance measurement module, all residing on the agent, perform event notification filtering, counting, and thresholding in the agent. In accordance with the preferred embodiments, only an alarm is sent to the manager from the agent if event notifications exceed a threshold that is established by the manager on the agent.

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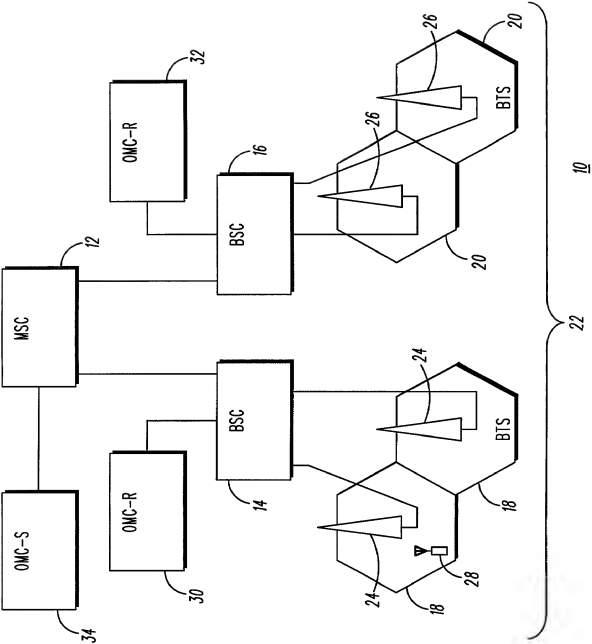


FIG. 1



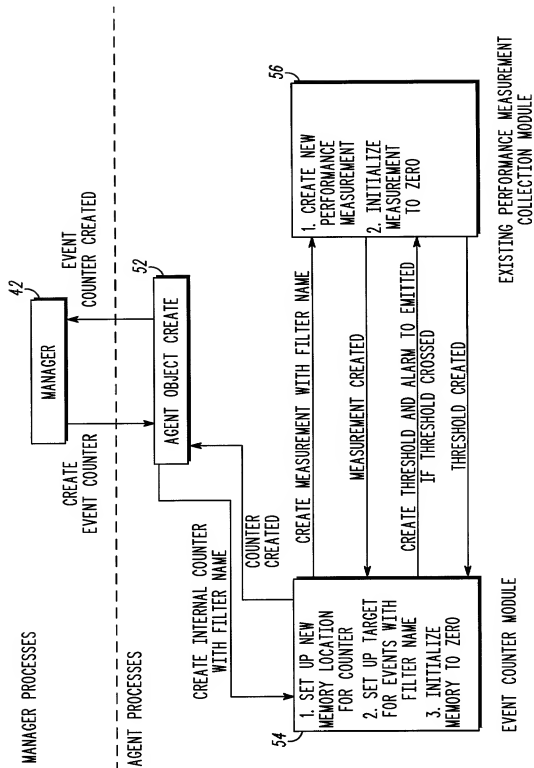
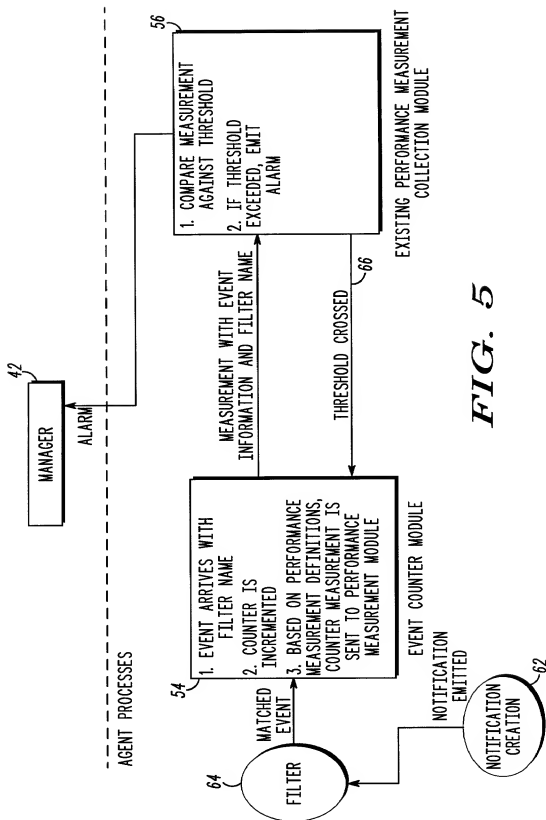


FIG. 4



PATENT APPLICATION DECLARATION
COMBINED WITH POWER OF ATTORNEY

Attorney's Docket No.: CE03958R



Regular (Utility)



Design Application

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

MANAGER-DIRECTED METHOD FOR EVENT PRESSURE REDUCTION

the specification of which:



is attached hereto



was filed on: _____

as U.S. Serial No.: _____

and was amended on _____

(if applicable)

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to the patentability of this application in accordance with 37 CFR § 1.56(a).

I hereby claim foreign priority benefits under 35 U.S.C. § 119(a)-(d) or 365(b) of any foreign application(s) for patent or inventor's certificate or 365(a) of any PCT international application which designated at least one country other than the United States of America, listed below and have also identified below, by checking the box, any foreign application for patent or inventor's certificate, or of any PCT international application having a filing date before that of the application on which priority is claimed:

Prior Foreign Application(s):



no such application(s) filed



such application(s) identified as follows:

Application Number	Country	Date of Filing (day, month, year)	Priority Claimed	
			<input type="checkbox"/> Yes	<input type="checkbox"/> No
			<input type="checkbox"/> Yes	<input type="checkbox"/> No

CE03958R

05592758-061300

I hereby claim the benefit under 35 U.S.C. §119(e) of any United States provisional application(s) listed below:

Provisional Application Serial No.: _____

Provisional Application Filing Date: _____

I hereby claim the priority benefit under 35 USC §120 of any United States application(s), or 365(c) of any PCT international application designating the United States of America, listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States or PCT International application in the manner provided by the first paragraph of 35 USC 112, I acknowledge the duty to disclose information which is material to patentability as defined in 37 CFR §1.56 which became available between the filing date of the prior application and the national or PCT international filing date of this application.

Prior U.S. Application(s):



no such application(s) filed



such application(s) identified as follows:

U.S. Parent Application No. or PCT Parent No.	Filing Date (day, month, year)	Status (Patented, Pending, Abandoned)

AS A NAMED INVENTOR, I HEREBY APPOINT THE FOLLOWING REGISTERED ATTORNEY(S) OR AGENT(S) TO PROSECUTE THIS APPLICATION AND TO TRANSACT ALL BUSINESS IN THE PATENT AND TRADEMARK OFFICE CONNECTED THEREWITH:

CUSTOMER NUMBER 22917

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(847) 576-0379

Fax (847) 576-3750

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 USC and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Full name of first-named or sole inventor <u>TIMOTHY L. POWERS</u>		
Inventor's signature <u><i>Timothy L. Powers</i></u>	Date <u>June 6, 2000</u>	
Residence <u>Harvard</u>	Illinois	
City	State or Foreign Country	
Citizenship <u>USA</u>	Country	
Post Office Address <u>9520 French Drive</u>		
Street Address		
<u>Harvard</u>	<u>Illinois</u>	<u>60033</u>
City	State or Country	Zip Code

Full name of second-named joint inventor <u>ROBERT A. PATZER</u>		
Inventor's signature _____	Date _____	
Residence <u>Lake Zurich</u>	Illinois	
City	State or Foreign Country	
Citizenship <u>USA</u>	Country	
Post Office Address <u>211 Alpine Drive</u>		
Street Address		
<u>Lake Zurich</u>	<u>Illinois</u>	<u>60047</u>
City	State or Country	Zip Code

PATENT APPLICATION DECLARATION
COMBINED WITH POWER OF ATTORNEY

Attorney's Docket No.: CE03958R



Regular (Utility)



Design Application

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

MANAGER-DIRECTED METHOD FOR EVENT PRESSURE REDUCTION

the specification of which:



is attached hereto



was filed on: _____

as U.S. Serial No.: _____

and was amended on _____

(if applicable)

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to the patentability of this application in accordance with 37 CFR § 1.56(a).

I hereby claim foreign priority benefits under 35 U.S.C. § 119(a)-(d) or 365(b) of any foreign application(s) for patent or inventor's certificate or 365(a) of any PCT international application which designated at least one country other than the United States of America, listed below and have also identified below, by checking the box, any foreign application for patent or inventor's certificate, or of any PCT international application having a filing date before that of the application on which priority is claimed:

Prior Foreign Application(s):



no such application(s) filed



such application(s) identified as
follows:

Application Number	Country	Date of Filing (day, month, year)	Priority Claimed	
			<input type="checkbox"/> Yes	<input type="checkbox"/> No
			<input type="checkbox"/> Yes	<input type="checkbox"/> No

I hereby claim the benefit under 35 U.S.C. §119(e) of any United States provisional application(s) listed below:

Provisional Application Serial No.:

Provisional Application Filing Date: _____

I hereby claim the priority benefit under 35 USC §120 of any United States application(s), or 365(c) of any PCT international application designating the United States of America, listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States or PCT International application in the manner provided by the first paragraph of 35 USC 112, I acknowledge the duty to disclose information which is material to patentability as defined in 37 CFR §1.56 which became available between the filing date of the prior application and the national or PCT international filing date of this application.

Prior U.S. Application(s):



no such application(s) filed



such application(s) identified as follows:

U.S. Parent Application No. or PCT Parent No.	Filing Date (day, month, year)	Status (Patented, Pending, Abandoned)

AS A NAMED INVENTOR, I HEREBY APPOINT THE FOLLOWING REGISTERED ATTORNEY(S) OR AGENT(S) TO PROSECUTE THIS APPLICATION AND TO TRANSACT ALL BUSINESS IN THE PATENT AND TRADEMARK OFFICE CONNECTED THEREWITH:

CUSTOMER NUMBER 22917

Send correspondence to Customer Number **22917**

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I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 USC and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Full name of first-named or sole inventor <u>TIMOTHY L. POWERS</u>		
Inventor's signature _____		Date _____
Residence	<u>Harvard</u>	<u>Illinois</u>
	City	State or Foreign Country
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City	State or Country	Zip Code

Full name of second-named joint inventor <u>ROBERT A. PATZER</u>		
Inventor's signature <u><i>Robert A. Pazer</i></u>		Date <u>5/18/00</u>
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